REMARKS

This Amendment is submitted in response to the final Office Action mailed on January 2, 2009, and the Advisory Action mailed on March 17, 2009. A Request for Continued Examination ("RCE") ($810.00) is submitted herewith. The Director is authorized to charge $810.00 for the RCE and any additional fees which may be required, or to credit any overpayment to Deposit Account No. 02-1818. If such a withdrawal is made, please indicate the Attorney Docket No. 112857-402 on the account statement.

Claims 27-28, 35-36 and 39-42 are pending in this application. Claims 1-26, 29-34 and 37-38 were previously canceled without prejudice or disclaimer. In the Advisory Action, the previous written description, anticipation and obviousness rejections were maintained. In the Final Office Action, Claims 27-28, 35-36 and 39-42 were rejected under 35 U.S.C. §112. Claims 27-28, 35-36 and 39-42 were further rejected under 35 U.S.C. §102 or, alternatively, under 35 U.S.C. §103. In response, Claims 27-28, 35-36 and 39-42 have been canceled and Claims 43-51 have been newly added. The newly added claims do not add new matter. The newly added claims are supported in the Specification at, for example, page 1, paragraphs 11-18; page 2, paragraphs 19-20 and 33-35; page 3, paragraph 57; pages 3-4, paragraph 58; page 4, paragraphs 61-63; Figs. 1 and 4.

In light of the cancellation of Claims 27-28, 35-36 and 39-42, Applicants respectfully submit that the previous rejections should be withdrawn. Furthermore, for at least the reasons set forth below, Applicants respectfully submit that the newly added claims are patentable.

In the Final Office Action, Claims 27-28, 35-36 and 39-42 were rejected under 35 U.S.C. §112, first paragraph, as allegedly failing to comply with the written description requirement. While Applicants do not agree with the Patent Office position, the newly added claims have been written in the spirit of cooperation and an effort to streamline examination of this case, and thus the newly added claims should be deemed to satisfy the §112 requirements.

In the Final Office Action, Claims 27-28, 35-36 and 39-42 were rejected under 35 U.S.C. §102(e) as being anticipated by, or alternatively, under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,773,692 B2 to Pecharsky et al. ("*Pecharsky*"). For at least the reasons set forth below, Applicants respectfully submit that *Pecharsky* fails to disclose or suggest each and every element of newly added independent Claims 43 and 47 and Claims 44-46 and 48-51 that depend therefrom.

Claim 43 recites, in part, a hydrogen occluding material in a form of a fine powder capable of hydrogenation and/or dehydrogenation of hydrogen molecules or hydrogen atoms at about 200°C or below and under adequate control of pressure, said hydrogen occluding material comprising: an aluminum hydride having a formula AlH_x, where $0 \leq x \leq 3$; and a dopant functioning as a catalyst, wherein: the dopant is present on a surface of the aluminum hydride and includes at least one species selected from the group consisting of transition metals belonging to groups III to V of the periodic table, an amount of the dopant ranges from about 0.2 mol% to about 10 mol% of an amount of the aluminum hydride, and the hydrogen occluding material is capable of releasing greater than 5.6 weight % hydrogen.

Claim 47 recites, in part, a method for releasing hydrogen gas using a hydrogen occluding material in a form of a fine powder, wherein the hydrogen occluding material comprises an aluminum hydride and a dopant functioning as a catalyst, the method comprising thermally decomposing the aluminum hydride having a formula AlH_x, where $0 \leq x \leq 3$, under adequate control of pressure by heating the hydrogen occluding material to a temperature of greater than 100°C and less than or equal to 200°C, wherein: the dopant includes at least one species selected from the group consisting of transition metals belonging to groups III to V of the periodic table, an amount of the dopant ranges from about 0.2 mol% to about 10 mol% of an amount of the aluminum hydride, and the aluminum hydride has a hydrogen storage capacity greater than an alanate.

Conventional hydrogen storage materials such as alanates undergo thermal dissociation in two stages to release hydrogen. See, Specification, page 1, paragraphs 7-10. However, alanates can only release up to 5.6 weight % hydrogen. See, Specification, page 1, paragraph 11, lines 1-4. Therefore, the present Specification provides a hydrogen occluding material comprising an aluminum hydride of the formula AlH_x, where $0 \leq x \leq 3$, and a dopant functioning as a catalyst. The catalyst and the aluminum hydride are mixed to form a composite material in which the catalyst exists on the surface of the AlH_3. See, Specification, page 4, paragraph 61, lines 5-7; paragraph 63, lines 1-6. The resulting mixture is heated to 200°C to release hydrogen in one stage. See, Specification, page 3, paragraph 57, lines 1-4; page 4, paragraph 62, lines 1-2. The amount of hydrogen released from the dopant-hydride composite material is greater than 5.6 weight %. See, Specification, page 1, paragraph 10, lines 1-4; paragraph 11, lines 1-4; paragraph

12, lines 1-7; page 2, paragraph 19, lines 3-5; Fig. 4. In contrast, *Pecharsky* fails to disclose or suggest every element of the newly added claims.

With respect to Claims 43-46, *Pecharsky* fails to disclose or suggest a hydrogen occluding material comprising: an aluminum hydride having a formula AlH_x, where $0 \leq x \leq 3$; and a dopant functioning as a catalyst, wherein: the dopant is present on a surface of the aluminum hydride and the hydrogen occluding material is capable of releasing greater than 5.6 weight % hydrogen as required, in part, by independent Claim 43. In the Advisory Action, the Patent Office asserts that the catalyst disclosed in *Pecharsky* "would necessarily be present on the surface of the AlH_3 as a result of the [ball-mill] mixing." See, Advisory Action, page 2, lines 11-13. Thus, the Patent Office admits that the catalyst cannot be present on the surface of the aluminum hydride until after the ball-mill mixing. However, *Pecharsky* is entirely directed to releasing hydrogen from its hydride during ball-mixing. See, *Pecharsky*, Abstract, lines 3-7; column 3, lines 25-30; column 4, lines 41-45; column 5, lines 20-25 ("During the processing, the solid hydride releases pure gaseous hydrogen"). Therefore, little hydrogen remains in the mixture obtained after ball-milling.

In fact, all of the examples in *Pecharsky* show that the mixture obtained after ball-milling contains as little as 0% and a maximum of 2.7 weight % residual hydrogen. See, *Pecharsky*, column 8, lines 27-34; column 9, lines 1-8 and 45-51; column 10, lines 29-35. In the Advisory Action, the Patent Office asserts that a reference is applicable for all that it teaches and suggests, not just examples. See, Advisory Action, page 2, lines 14-15. However, even if *Pecharsky* arguably applies to alanates and AlH_3, Applicants respectfully submit *Pecharsky* still does not teach or suggest that its post-ball-mill mixture can have more than 5.6 weight % hydrogen. For example, if AlH_3 is used instead of an alanate, the maximum theoretical amount of hydrogen it can release is 10.0 weight %. See, Specification, page 2, paragraph 19, lines 1-5. *Pecharsky* requires that at least 4.5 weight % hydrogen is released from its solid hydrides at ambient conditions during the mechanical processing. See, *Pecharsky*, column 4, lines 28-33 and 41-43. Thus, the final mixture obtained after ball-milling in *Pecharsky* cannot release more than 5.5 weight % hydrogen. Furthermore, since 10.0 weight % is the maximum theoretical value, Applicants respectfully submit that the actual amount of hydrogen that can be released is much lower than 5.5 % as suggested by the examples in *Pecharsky*. As such, Applicants respectfully submit that *Pecharsky* fails to disclose or suggest a hydrogen occluding material in which a

dopant is present on a surface of the aluminum hydride and the hydrogen occluding material is capable of releasing greater than 5.6 weight % hydrogen in accordance with Claims 43-46.

With respect to Claims 47-51, *Pecharsky* also fails to disclose thermally decomposing the aluminum hydride having a formula AlH_x, where $0 \leq x \leq 3$, by heating the hydrogen occluding material to a temperature of greater than 100°C and less than or equal to 200°C. *Pecharsky* is entirely directed to releasing hydrogen by performing mechanical processing, such as ball-milling, in the presence of a catalyst. See, *Pecharsky*, Abstract, lines 3-7; column 3, lines 25-30; column 4, lines 41-45; column 5, lines 20-25. *Pecharsky* specifically distinguishes its method of hydrogen release from thermal decomposition of aluminum hydrides. See, *Pecharsky*, column 1, lines 66-67; column 2, lines 1-46 and 64-67. In fact, *Pecharsky* states that its method "has an advantage over previously known methods where hydrogen gas is obtained during decomposition of aluminohydrides using thermal treatment because the input of energy (e.g., mechanical energy) and the method overall are much easier to control." See, *Pecharsky*, column 6, lines 41-46. Furthermore, *Pecharsky* teaches that its mechanical processing occurs at temperatures between -200°C and about 100°C, preferably at ambient temperature. See, *Pecharsky*, column 4, lines 65-67; column 5, lines 1-5. Therefore, *Pecharsky* fails to disclose or suggest thermally decomposing the aluminum hydride having a formula AlH_x, where $0 \leq x \leq 3$, by heating the hydrogen occluding material to a temperature of greater than 100°C and less than or equal to 200°C as required, in part, by Claims 47-51.

Accordingly, Applicants respectfully submit that Claims 43-51 are patentable over *Pecharsky*.

For the foregoing reasons, Applicants respectfully submit that the present application is in condition for allowance and earnestly solicit reconsideration of same.

Respectfully submitted,

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